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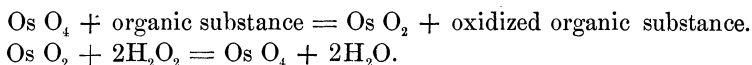
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That is, in bleaching a tissue, the Os O_2 is converted into Os O_4 , and water is formed, with which the tissue is already saturated.

To restore 100 cc. of a 1% solution of osmium tetroxide requires from 10 to 20 drops of fresh peroxide of hydrogen, and clearing goes on better in full sunlight. To bleach tissue with peroxide requires about the same amount in 100 cc. of water, and the bleaching takes place better in the sunlight also. The amount needed cannot be stated with any more precision because the peroxide loses its strength somewhat with age. The peroxide made by the Oakland Chemical Co., 54 South Avenue, New York, is more stable and keeps better than many of the preparations in the market.—C. L. BRISTOL.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

The Geological Society of America.—The Fifth Annual Meeting was held at Ottawa, Canada, on December 28, 1892, and following days. The following papers were read: Notes on the Early Palaeozoic Sponges, Sir J. William Dawson, Montreal, Can.; Notes on the Devonian Formation of Manitoba and the N. W. Territories, J. F. Whiteaves, Ottawa, Ont. The object of this paper was to show the relationship of Devonian formation of Manitoba and the N. W. Territories with that of Northern Europe. In Manitoba the Stringocephalus zone is remarkably well developed and holds a rich fauna, whereas in the Mackenzie River district, most of the fossils so far collected seem to be from the Cuboides zone. On the Coals and Petroleums of the Crows's Nest Pass, Rocky Mountains, A. R. C. Selwyn, Ottawa, Ont.; On the Geology of Natural Gas and Petroleum in Ontario, H. P. Brumell, Ottawa, Ont. A brief résumé of work done in gas and oil explorations in Ontario, and dealing with the geological evidence adduced from record of wells sunk. Including also a short account of the geology of Southwestern Ontario. Some Features of the Phosphate Bearing Rocks of Ottawa County, P. Q., Elfric Drew Ingall, Assoc. Royal School of Mines, Eng. (Introduced by J. B. Tyrrell.) This was a preliminary paper, based upon field observations, discussing the phenomena exhibited by the Apatite deposits and their associated rocks in their bearing upon the question of the probable mode of formation of these deposits. Some Maryland Granites and Their Origin, Charles Rollin Keyes, Des Moines, Ia. A brief sketch of the granite

rocks of Maryland, with a summary of the reasons for regarding them as eruptive in origin. Epidote as a Primary Component in Granites, Charles Rollin Keyes, Des Moines, Ia. Occurrences of the mineral in certain granites regarded as eruptive described, the evidences of its original nature explained and its associations with the closely related Allanite considered. On the Laurentian of the Ottawa District, Robert W. Ells, Ottawa, Ont. The paper briefly reviewed the work of the late Sir Wm. Logan in this district, forty years ago, and discussed the structure of the calcareous portion of the system, more particularly as regards the relationship of the crystalline limestones to the underlying gneiss; with a brief statement of the several kinds of intrusive rocks which penetrate both the gneiss and limestone, and their apparent influence upon the occurrence of the economic minerals, such as graphite, apatite and mica. The Contact of the Laurentian and Huronian North of Lake Huron, Robert Bell, Ottawa, Ont. The line of contact between the Great Huronian Belt to the northward and the Laurentian area to the southward was traced from near Killarney on Lake Huron to its intersection with the Ottawa River. The two sets of rocks in this region were described with regard to their structure and their relations to one another. The nature of their contact here and in other instances in Canada was described in connection with the question of the conformability or otherwise of the two systems. Reference was made to the extraordinary development of quartzite in the LaCloche region, to certain forms resembling fossils lately discovered by the writer in the Huronian rocks of the vicinity, to the greenstone masses and dykes, to the nature of the granites and to other points in connection with the geology of the district. The marked dependence of the physical geography upon the phenomena of crystalline rocks of the region was likewise pointed out. The Archean Rocks West of Lake Superior, W. H. C. Smith, Ottawa, Ont. (Introduced by R. W. Ells.) This paper gave a brief description of the rocks and their distribution between the Lake of the Woods and Lake Superior north of the International boundary and referred to some of the theories of origin and structure of the various members of the Archean system and to the iron ores and gold-bearing rocks of the region. On the Archean of Sudbury Mining District, Alfred E. Barlow, M. A., Geological Survey Department, Ottawa, Ont. This paper related in detail the various phenomena in connection with the contact between the Laurentian and Huronian to the northeast of Lake Huron, with a discussion of the origin and relative age of each, based on these observations. Notes on Cambrian Fossils from the

Selkirks and Rocky Mountain Region of Canada, Henry M. Ami, Ottawa, Ont. This paper was based mainly upon a collection of Lower and Middle Cambrian fossils made by the author in the summer of 1891. It contains notes on some eight species of Lower Cambrian (*Olenellus* zone) fossils from the gray, glossy and calcareous schists and limestones of the entrance to the Selkirks, some two miles west of Donald, British Columbia. The latter part of the paper dealt with the forms met with in the Middle Cambrian of Mount Stephen in the Rocky Mountains, near Field, B. C., where the terrane is highly fossiliferous. Upwards of twenty species have been recorded from this locality, many of which are very interesting and well preserved. On the Potsdam and Calciferous Terranes of the Ottawa Paleozoic Basin, Henry M. Ami, Ottawa, Ont. The stratigraphical, lithological and paleontological relations of the Potsdam and Calciferous terranes, as seen and known in the Ottawa palæozoic basin and elsewhere were discussed in this paper; also the reference of these two terranes to the Cambro-Silurian or Ordovician Epoch instead of to the Cambrian Epoch, inferred from the internal evidence. The Criteria for the Recognition of Separate Ice Epochs, R. D. Salisbury, Chicago, Ill.; Note on the Geology of Middleton Island, Alaska, George M. Dawson, Ottawa, Ont. This short paper was devoted principally to the description of a boulder-clay or till from Middleton Island, which is found to contain some marine fossils. Eskers Near Rochester, N. Y., Warren Upham, Somerville, Mass. The Pinnacle Hills, a very remarkable esker series in the southeastern suburbs of Rochester, were described and attributed to deposition by a glacial river flowing between walls of ice and open above to the sky. Their material, which is shown to have been englacial, is chiefly gravel and sand, but also comprises in some parts very abundant and large boulders, some of which are lifted 200 feet or more above their sources within a few miles on a nearly plain country. Similar explanations are also applicable to other eskers in Pittsford, several miles farther southeast. Comparison of Plistocene and Present Ice-Sheets, Warren Upham, Somerville, Mass. The Plistocene ice sheets of North America and Europe were compared with the now existing Malaspina, Greenland, and Antarctic ice-sheets, as to their areas, surface slopes and probable thickness, rates of erosion and ablation, subglacial and englacial drift, and manner of deposition of various drift formations. The Malaspina glacier or ice-sheet, covered on its wasting borders by much drift and growing forests, is believed to afford explanations of forest beds between deposits of till, and of the peculiar drift accumulations named drumlins, both

being attributable to stages in the general recession of the North American ice-sheet when increased snowfall and onflow of the ice slackened its retreat or caused it temporarily to re-advance. Under this view, the Ice-Age seems probably to have comprised only one great epoch of glaciation, with moderate oscillations of the ice-front, and to have been geologically brief. Plistocene Phenomena in the Region Southeast and East of Lake Athabaska, Canada, J. B. Tyrrell, Ottawa, Can. The paper was the result of an exploration conducted by the writer during the past summer in the hitherto unexplored region lying southeast of Athabaska Lake and north of Churchill River. The region has some strongly marked glacial features. The writer discussed the striation and character of the rock surfaces, the occurrence of till, drumlins, kames, and other glacial phenomena. Some high-level beaches, terraces, and other post-glacial deposits were also noted. Notes on the Glacial Geology of the Northeast Territories, A. P. Low, Ottawa, Ont. A short account of the geography and surface geology of the western water-shed of Labrador Peninsula, derived from explorations on the Rupert, East Main, Big, Great Whale and Clearwater Rivers, and along the east coast of Hudson Bay. Notes on the Gold Range in British Columbia, James McEvoy, B. A. Sc., Ottawa, Ont. (Introduced by H. M. Ami.) A short description of the topography of the Gold Range and part of the adjoining Interior Plateau country, with notes on the glacial geology of the same. The Glacial Gravels of Glacier Bay, Alaska, Harry Fielding Reid, Cleveland, Ohio (Introduced by J. S. Diller). The Post-glacial Outlet of the Great Lakes Through Lake Nipissing and the Mattawa River, G. Frederick Wright, Oberlin, O.; The Height of the Bay of Fundy Coast in the Glacial Period Relative to Sea Level, as Evidenced by Marine Fossils in the Boulder Clay at Saint John, New Brunswick, Robert Chalmers, Ottawa, Ont. Description of locality, area and thickness of boulder-clay. Divergent striæ on underlying rocks. The materials of the boulder-clay from the north. Intercalated stratified portions and their fossils deposited in the sea. Sections at Fern Ledges and Negrotown Point given. The conclusions are that the climate was Arctic or sub-arctic; that the boulder clay here was formed by a number of successive accretions in a zone of oscillation of the ice-front, and that its upper portion at least was thrown down when the lands stood 100 to 200 feet below its present level. On Certain Features in the Distribution of the Columbia Formation on the Middle Atlantic Slope, N. H. Darton, Washington, D. C. This paper was a description of relations indicating an interval of erosion between the depositions of the

high-level and low-level portions of the formation, beginning in Southern Maryland and gradually increasing northward to New Jersey. A Geological Reconnaissance in the Central Part of the State of Washington, Israel C. Russell, Ann Arbor, Mich. The region traversed embraces about 10,000 square miles in the arid region east of the cascades and drained by the Columbia. The reconnaissance was made for the purpose of learning how far the conditions there existing favor the project of obtaining artesian water for irrigation. The following is a syllabus of the paper.

Geography of the region explored.

Geological formations.

Crystalline rocks.

Kittitas system.

Columbia lava.

John Day system.

} Tertiary.

Glacial records,

Lake Lewis,

} Pleistocene.

Geological structure. Existing lakes. Artesian water supply.

The Abandoned Strands of Lake Warren, Andrew C. Lawson, Berkeley, Cal. The strands of Lake Warren, on the north side of Lake Superior, up to an elevation of 1200 feet above sea-level are post-glacial. It was not an ice-dammed lake. There was an outlet northward corresponding to one of its higher stages. A post-glacial depression of Central Canada whereby the James Bay slope was covered with marine sediments to a present altitude of 450 feet above tide and only 150 miles distant from Lake Superior is correlated with the maximum fullness of Lake Warren, and the subsequent uplift is correlated with its subsidence. The strand lines show no evidence of deformation. In the absence of ice dams and of a gorge of permanent drainage, the Level of Lake Warren could only have been lowered by epeirogenic depression along its southeastern margin, *i. e.*, in the region south of Lakes Huron and Michigan, which depression is thus coeval with the post-glacial uplift of central Canada. High terraces and beaches are known to extend along the north side of Lake Huron from Sault St. Marie eastward and they are reported on the high lands of the Peninsula of Ontario; so that Lake Warren must have been the greatest of the known Quaternary Lakes. Its area is roughly estimated at 150,000 square miles. The Importance of Photography in Illustrating Geological Structure, R. W. Ells, Ottawa, Ont. In connection with this paper was shown a series of large photographs by Topley, taken under the direction of the writer, showing more clearly the mode of occurrence of the apatite in the deposit of the Buckingham and Lievre district, as well as the relations of the intrusive

apatite-bearing rocks to the surrounding gneiss. Two Neocene Rivers of California, Waldemar Lindgren, Washington, D. C. It was the purpose of this paper to briefly indicate the direction and grade of the *principal forks* of the Neocene equivalents of the present Yuba and American Rivers. These streams now drain an area in which many important Neocene gravel deposits are located, and to trace the old water courses is of the highest importance in order to successfully open and mine the auriferous channels. The results recorded here have been reached during the course of the investigation of the Gold Belt carried out under the direction of Dr. G. F. Becker, by the U. S. Geological Survey.

The geological events related to the accumulation and covering up of the Neocene channels were briefly sketched and the different systems of channels described. The fact was accentuated that the Neocene rivers closely correspond to those of the present day in the extent of their watersheds, although by no means always in the direction of their principal forks. A short statement was given of the work previously done in the same field by other investigators.

The course of the Neocene Yuba and American Rivers was described, by the aid of a map, on a small scale. In places where differing results have been obtained from those of other observers, or where new facts have been brought out, a more detailed statement was given. *Practical results*: The greater part of these Neocene channels is now covered by heavy masses of volcanic material and many of them, though auriferous, have not yet been opened for mining operations. The continuity of certain channels under the lava cap can be asserted and their approximate positions indicated; some of them, most likely to prove remunerative, but which have not yet been opened up, were mentioned; among them are the Blue Tent Channel, the Long Canyon Channel, and the Webber Creek Channel.

Boston Society of Natural History.—Dec. 21.—The following papers were read: Some New Experiments on the Absorption of Liquids by Aerial Parts of Plants, Mr. W. F. Ganong; The Abdominal Pouch of Butterflies of the Genus *Parnassius*, Mr. S. H. Scudder; Columnar Structure in Stratified Rock, Prof. W. H. Niles.

January 4, 1893.—The following papers were read: Account of Some of the Botanical Establishments of Europe (photographs were shown), Prof. W. G. Farlow; Application of the Microscope to the Study of Rocks (colored stereopticon views were shown), Dr. J. Eliot Wolff.

SAMUEL HENSHAW, *Secretary*.

New York Academy of Sciences, Biological Section.—Meeting of Dec. 12.—The following is a synopsis of the papers: On the Miocene Deposits of the White River, by Dr. J. L. Wortman; These deposits were arranged in three groups, *lower* or *Menodus* beds, *middle* or *Oreodon* beds, and *upper* or *Protoceras* beds. The *Protoceras* beds were regarded as in part contemporary with the *John Day* beds of Oregon. On the ileo-colic junction of *Procyon lotor* and allied Arctoids, by G. S. Huntington. The absence of cæcum in *Procyon* was noted as repeating the condition found in *Hyæna* and the *Ursidæ*. The provision for preventing return of contents of large intestine appears to consist in a series of constrictions in the terminal part of the ileum together with increase in the circular muscular fibres in these situations as well as at the ileo-colic junction itself. There is a complete absence of an ileo-colic valve. On the Origin of West Indian Bird Life, by F. M. Chapman. Conclusions from study of bird and mammal life were (1) distinctness geologically of Lesser from Greater Antilles; (2) independence of islands from mainland since the appearance of the present fauna; (3) original connection of West Indies to Central America by way of Jamaica; Central America at this time an archipelago created by passage leading from Pacific to Caribbean Sea; (4) the older faunal forms of the West Indies represent survivors of the insular Tertiary species; (5) the newer forms are immigrants and become differentiated under new conditions of living. H. F. Osborn reported the discovery in the Miocene of South Dakota of a horned artiodactyle represented by male and female skulls and complete fore and hind feet. The female skull is comparatively hornless and proves to be identical with *Protoceras celer* Marsh. The male skull exhibits no less than five protuberances upon each side or ten altogether. Two of these upon the frontals and sides of the maxillaries are very small; the parietal, supraorbital and maxillary protuberances are very prominent and had apparently a dermal covering as in the giraffe. There are four toes in front and two behind as in the early *Tragulidæ*. The types were found by Dr. J. L. Wortman, and are in the recent collections of the Am. Mus. Nat. Hist.

BASHFORD DEAN, *Sec. Biol. Section.*

Natural Science Association of Staten Island.—Nov. 12, 1892.—The election of officers for the ensuing year resulted as follows: President, Walter C. Kerr; treasurer, Thos. Craig; recording secretary, Joseph C. Thompson; corresponding secretary, Arthur Hollick. A paper on Our Historic Landmarks, by Mr. Ira K. Morris, was read by

title, and will be published as a "special" later on. Dr. N. L. Britton presented specimens of *Aspidium cristatum* (L.) Sw., collected by Mrs. N. L. Britton, near Oakwood. This fern is exceedingly rare on Staten Island, having been previously reported from but two localities, in one of which, the Clove Lake Swamp, it has been since exterminated.

Mr. Arthur Hollick read the following paper Upon Additions to the Cretaceous Flora of Staten Island.

At the meeting of January 2, 1892, I gave a preliminary account of the Cretaceous fauna and flora of the island so far as studied up to that date. At the meeting of March 12, the rediscovery of fossil leaves in the Kreischerville clays was recorded, and also the discovery of a large fossil leaf near Richmond Valley. At the meeting of September 10 the discovery by Mr. Heinrich Ries of fossil leaves in the Cretaceous clay at Green Ridge was recorded and since that time Mr. Wm. T. Davis has turned over to me a number of other specimens found by him in the clay at Kreischerville.

All this new material and such of the old as had not been critically examined has been the subject of careful study by me during the past few months with the result that there has been added at least thirty-eight species to our Cretaceous flora.

Most of them were known previously from the clays of Woodbridge or Amboy, N. J., but others have not before been reported from Eastern North America and we here have their first recorded occurrence in this region. Of these fourteen represent species new to science.

The specimens have all been shown from time to time at our meetings, and from these careful drawings have been made. The entire subject will be presented before the New York Academy of Sciences shortly, with full descriptions and figures of all the new species, which will be published in the Transactions in due time.

We have forty-seven species representing the flora of the Cretaceous formation on Staten Island. All the specimens from Tottenville, Richmond Valley, Princes Bay and Arrochar are in ferruginous rock of a concretionary character and are well preserved. Those from the clays of Green Ridge and Kreischerville soon began to disintegrate upon exposure to the air and are now mostly useless for purposes of identification.

Dec. 17, 1892.—A specimen of European "Gorse" or "Furze," sent by Dr. F. Hollick, was shown and the following memorandum read:

The accompanying specimen was obtained Nov. 10, from a small bush, about a foot in height, of European furze (*Ulex europæus* L.), which is growing wild on Ward's Hill, Tompkinsville. I first discov-

ered it during the early autumn. To all appearances the plant is self-seeded, and is remote from any garden or cultivated ground. The only other vegetation in the vicinity is short stunted grass, so that the bush in spite of its small size, is a conspicuous object and has probably only escaped destruction by reason of its sharp prickly foliage. The locality is strikingly similar to the "commons" or "downs" where it grows in Great Britain. How it came here is a mystery, as the only other place where it is known to occur in America, so far as I am aware, is on the Island of Nantucket, where it was introduced about 1860, and has since spread to some extent. If protected and encouraged it would doubtless become established here and spread as it has done in the latter locality.

Mr. William T. Davis exhibited *Cecropia* cocoons which had been partly destroyed by woodpeckers, and read the following paper on woodpeckers and *cecropia* cocoons.

The caterpillars of the *Cecropia* moth spin their cocoons in a variety of places; occasionally on the flat side of a board fence, sometimes at the base of bushes such as the elder, and sometimes at the ends of swaying branches when the food plant happens to be a tree. The cocoons spun near the ground are often devoured by mice that gnaw through the silken coats to the edible pupa within. Specimens which had been thus destroyed were shown to this Association by Mr. Joseph C. Thompson on Dec. 12, 1889. Cocoons that are placed on tree branches are more safe from the attacks of mice, but are liable to be eaten by woodpeckers.

On January 14, 1888, I saw a downy woodpecker investigating a *Cecropia* cocoon in a white maple, the woodpecker thrusting its bill in and pulling it out of the cocoon quite frequently. After a while it flew to another cocoon a few feet away, but it being on such a small branch it was unable to successfully pick it open, as the branch swayed up and down. It was then plain what a great protection it was to the insects to place their cocoons near the branch ends, though no doubt they are sometimes killed by the swaying of these branches during a storm.

When the woodpecker was gone I cut the cocoon off and found a small hole on its side quite near the branch, where it was easiest to drill because the silken fabric gave way the least to the strokes of the bird. Cutting open the other side of the cocoon, I found that the pupa shell was sucked nearly dry of its contents.

The *Cecropia* cocoons, occurring commonly on white maples, are generally placed near the ends of the long drooping branches, and it will be seen from the foregoing that it is probably the safest situation afforded by the tree. Near my home there is a small white maple that has eight *Cecropia* cocoons on its branches, but only two of them, from their position, can be injured by a woodpecker.

If a woodpecker is successful in making a hole into a cocoon it is nevertheless sometimes disappointed at its contents. I have found a cocoon that contained the tough case of an Ichneumon fly pupa (*Ophion*), which had been drilled in the side by a woodpecker, and then abandoned, leaving the parasite unharmed.

Mr. Davis also submitted the following note:

The tawny thrush or Veery (*Turdus fuscescens*), has not been reported as nesting on the Island, but during the last spring and summer it was not uncommon at Watchogue. Several would often be heard singing at the same time, or be seen walking, hopping or running, for they do all three, along the wood paths and stopping by the way to turn over a countless number of dead leaves for the insects to be found beneath them. In every instance they frequented the edge of the close timber near to some open or half cleared ground, whither they often flew.

On June 26 I noticed a Veery carrying food in her bill, and was thus enabled, after a time, to discover a young bird perched on a log in a thick growth on the edge of a swamp. On July 10, with Mr. Walter Granger, of the American Museum, I heard many Veeries singing, but we were unsuccessful in finding a nest of the second brood.

It seems probable that this thrush has only been plentiful at Watchogue during the past summer, for just as close attention has been given to the district for a number of years, and yet only once before, namely in May, 1891, was a Veery heard singing.

Mr. Arthur Hollick read Notes on Staten Island Clays collected for the World's Fair.

Mr. L. P. Gratacap exhibited berries of *Smilax rotundifolia* and submitted a memorandum in connection with them.

Mr. Gratacap also exhibited drawings from microscopic examination of rocks to which seaweed had been attached, and read the following note:

The great quantity of rock used in constructing the roadbed of the Rapid Transit Railroad along our north shore has introduced upon the island a very representative collection of N. Y. Island rock, including mica schists, gneiss and granite. It serves the double purpose afford-

ing the local mineralogists an opportunity to study and collect feldspar, quartz and mica, with associated garnets and tourmalines and is a suggestion as well of the underlying reefs of archæan metamorphic masses upon which our own island is built, and our geological relationship with New York from whose ledges the rocks have been transported. Wherever these fragments have rolled down to the waters' edge or are so placed as to be inundated by the high tides, a very vigorous growth of the green filamentous seaweed (*Calothrix*?) has appeared. I am not sure that it is more marked than the similar growth over the traps, sandstones and shales which were the previous occupants of the shores of the Island, and which have been somewhat displaced from their intimacy with the waves and currents of the Kill van Kull by these later arrivals, but it does seem to me as if it had developed with interesting rapidity. The schistose flaky character of many or most of these fragments may have conduced to facilitate this luxuriant development; and where, as in the case of granite veins, the feldspar is coarsely brecciated, the interlacing lines of angular definition between the crystals offer a crevice for attachment. As a fact the lamellar fragments are more quickly invaded.

Placing under a microscope flakes of mica, feldspar and quartz, we can see the delicate filaments of the alga penetrating the films of the mica or occupying pits and irregular surfaces of the feldspar with distributed spots of green granules. Sometimes lacunæ or minute cavities, situated a little way within the edge of mica flakes, will be filled with the green spore-like groups. A few rude drawings show approximately some of the phases in this process of investment of the rock by the seaweed.

Cumulative effects have of late been much emphasized, and it is not unlikely that the alternating drying and swelling, from exposure to the sun at low and submergence at high water, of this alga may sensibly determine the duration, as a mass, of the more schistose or friable rocks, when the tiny extensions of this subtle enemy have effected an entrance within their substance.

The American Psychological Association—Met at Philadelphia, University of Pennsylvania, Tuesday and Wednesday, Dec. 27 and 28, 1892. On Tuesday, Dec. 27 there was a business meeting at which the nature of a permanent organization and other important questions will be discussed. The following papers were read:

Errors of Observation in Physics and Psychology; Prof. J. McK. Cattell, Columbia College; Experiments Upon Pain, Dr. Herbert

Nichols, Harvard University; Tactile Estimates of Thickness, Prof. Edward Pace, Catholic University, Washington; Some Experiments Upon the *Æsthetics* of Visual Form, Prof. Lightner Witmer, University of Pennsylvania; Investigations of Reaction-times of Various Classes of Persons, Prof. Lightner Witmer, University of Pennsylvania; History and Prospects of Experimental Psychology in America, President G. Stanley Hall, Clark University; Experimental Psychology at the World's Fair, Prof. Joseph Jastrow, University of Wisconsin.

Wednesday, Dec. 28.—Certain Phenomena of Rotation, Dr. Herbert Nichols, Harvard University; Note Upon the Controversy Regarding the Relation of the Intensity of the Stimulus to the Reaction Time, Prof. W. M. Bryan, University of Indiana; Minor Studies at the Psychological Laboratory of Clark University, Dr. E. C. Sanford, Clark University; Preliminary Notes Upon Psychological Tests in the Schools of Springfield, Mass., Prof. W. M. Bryan, University of Indiana.

Anthropological Society of Washington.—Dec. 20, 1892.—The program of exercises was as follows: Is Simplified Spelling Feasible? (Symposium.) Discussion by Prof. F. A. March, of Lafayette College, Hon. A. R. Spofford, Hon. Wm. T. Harris, Hon. Edwin Willits.

January 3, 1893.—The program of exercises was the following: Is Simplified Spelling Feasible as Proposed by the English and American Philological Societies? (Close of the Symposium.) Discussion by Prof. Lester F. Ward, Prof. Wm. B. Powell, Mr. James C. Pilling, Prof. Benj. E. Smith, Editor Century Dictionary; Dr. Charles R. G. Scott, Editor Worcester Dictionary; Mr. E. T. Peters, Major John W. Powell and Weston Flint. The discussion was closed by Hon. A. R. Spofford and Dr. Wm. T. Harris.—WESTON FLINT, *Secretary*.

The Biological Society of Washington.—Dec. 17, 1892.—The principal topic of the evening was What Should be the Scope and Object of a Biological Society? Introduced by Mr. B. E. Fernow. The following communications were read: Frost Freaks of the Dittany, Prof. Lester F. Ward; Notes on Peach Rosette, Dr. Erwin F. Smith; Destruction of Lichens on Pear Trees, Mr. M. B. Waite; Notes on Apple and Pear *Fusicladii*, Mr. D. G. Fairchild.

FREDERIC A. LUCAS, *Secretary*.

Indiana Academy of Science.—The eighth annual meeting was held in the Capitol Building at Indianapolis Dec. 28 and 29.

There was a large attendance of members and visitors. President J. L. Campbell, Wabash College, Crawfordsville, Ind., presided. The large number of papers entered made imperative the meeting of the Academy in three sections in the afternoon of the first day. These were so constituted that papers on mathematics, physics, chemistry and geology were read in one section; on botany in another; on zoology and anthropology in a third. On the evening of the first day the President delivered his address on The Independence of Liberal Pursuits. The following officers were elected for the next year: President, J. C. Arthur, Purdue University, Lafayette, Ind.; vice-president, W. A. Noyes, Rose Polytechnic Institute, Terre Haute, Ind.; secretary, A. W. Butler, Brookville, Ind.; assistant secretary, Stanley Coulter, Purdue University, Lafayette, Ind.; treasurer, C. A. Waldo, De Pauw University, Greencastle, Ind.; auditors, Thomas Gray, Rose Polytechnic Institute, Terre Haute, Ind.; W. S. Blatchley, High School, Terre Haute, Ind. L. M. Underwood, De Pauw University, Greencastle, Ind.; and W. A. Noyes, Rose Polytechnic Institute, Terre Haute, Ind., were appointed program committee. The Academy decided to hold its spring meeting the third week in May in Parks County, Ind., closing with an evening meeting Friday at Terre Haute, Ind.

The following papers were presented: Notes on the Reproduction and Development of *Grinnellia americana* Harv., M. A. Brannon; Evidence of Man's Early Existence in Indiana from the Oldest River Gravels Along the White Water River, A. W. Butler; On the Construction of a Sensitive Galvanometer, Benj. W. Snow; Some Facts as to the Varying Conditions of Rock Deposits as Observed in the Hudson River Beds of Indiana and an Inquiry as to the Cause of the Same, Joseph Moore; A Simple Air Thermometer for the Determination of High Temperatures, W. A. Noyes; Tests of the Torsional Strength of a Steel Shaft, Thos. Gray; An Extreme Case of Parasitism, Robert Hessler; Exhibition and Explanation of a Geological Chart, Elwood P. Cubberly; Local Variations, C. H. Eigenmann; Botanical Field Work in Western Idaho, D. T. MacDougal; The Quaternion Treatment of the Motion of Two or More Bodies Under the Law of Gravitation, A. S. Hathaway; The Electrical Oxidation of Glycerin, W. E. Stone and H. N. McCoy; Notes Concerning Tests of the Purdue Experimental Locomotive, W. F. M. Goss; The Electrostatic Theory of Cohesion and Vander Waal's Equation, Reginald A. Fessenden; On Sulphon-phtaleins, Walter Jones; Quartz Suspensions, Benj. W. Snow; Observations on Glacial and Pre-glacial Erosion at Richmond, Indiana, Joseph Moore; A Modification of Grandea's Method for

Determination of Humus in Soils, H. A. Huston and F. W. McBride ; Experiments with and Phenomena of Vacuum Tubes, R. A. Fessenden ; The Extraction of Xylan from Straw in the Manufacture of Paper, W. E. Stone and W. H. Test ; The Electro-magnetic Inertia of a Large Magnet, Thos. Gray ; The Determination of Chlorine in Natural Waters, W. A. Noyes ; Some New Electrical Apparatus, R. A. Fessenden ; Thiofurfurol and its Condensation Products, W. E. Stone and Clinton Dickson ; On the Construction and Use of a Bolometer, B. W. Snow ; On the Determination of Valence, P. S. Baker ; An Application of Mathematics in Botany, Katharine E. Golden ; On the Fertilization and Development of the Embryo in *Senecio aureus*, D. M. Mottier ; Distribution of the North American Cactaceæ (by title), John M. Coulter ; *Marchantia polymorpha*, not a Typical or Representative Liver-wort, L. M. Underwood ; Notes Concerning Certain Plants of the Southwestern Counties of Indiana, John S. Wright ; Spines and Epidermis of the Cactaceæ (by title), E. B. Uline ; Preliminary Notes on the Genus Cactus, E. M. Fisher ; An Auxanometer for the Registration of Growth of Stems in Thickness, Katharine E. Golden ; The Apical Growth of the Thallus of *Fucus vesiculosus*, D. M. Mottier ; Symbiosis of Orchidaceæ, M. B. Thomas ; Notes on Pedicellum, W. L. Bray ; The Genus *Corallorhiza*, M. B. Thomas ; Notes on Root Tubercles of Indigenous and Exogenous Legumes in Virgin Soil of the Northwest (by title), H. L. Bolley ; Notes on Archæology in Mexico, J. T. Scovell ; Notes on the loss of the Vomerine Teeth with Age in the Males of the Salamander, *Desmognathus fusca* (by title), F. C. Test ; Modern Geographical Distribution of Insects in Indiana (by title), F. M. Webster ; New Species of Indiana Hymenoptera, reared at LaFayette, Ind. (by title), F. M. Webster ; Description and Elevation of Mount Orizaba, J. T. Scovell ; The Climate and Glaciers of Mounts Orizaba and Popocatepetl, J. T. Scovell ; A Mite, Probably *Hypoderas columbae*, Parasitic in the Pigeon, W. W. Norman ; The Locustidæ of Indiana with Description of New Species, W. S. Blatchley ; Early Stages in the Development of Cymatogaster, C. H. Eigenmann ; Some Remarks Regarding the Embryology of Amphiuma, O. P. Hay ; Some Structural Peculiarities of Pacific Slope Fishes (by title), A. B. Ulrey ; Peculiar Death of an Oriole (by title), T. B. Redding ; The Range of the American Cross-bill (*Loxia curvirostra minor*) in the Ohio Valley, with Notes on its Unusual Occurrence in Summer, A. W. Butler ; A Note on *Loxia curvirostra*, W. S. Blatchley ; Notice of a Terrapin to be Restored to the Fauna of Indiana, O. P. Hay ; A Migration of Birds and one of Insects, T. B. Redding ; The South American Catfishes Belonging to

Cornell University (by title), E. M. Kindle ; Notes on the Genus *Lytta*, W. P. Shannon ; The Ichthyologic Features of the Black Hills Region, B. W. Evermann ; Explorations in Western Canada, C. H. Eigenmann ; Ancient Earthworks Near Anderson, Indiana, Francis A. Walker ; The Work of the U. S. Fish Commission Steamer Albatross in the North Pacific and Bering Sea in 1892, B. W. Evermann ; A Thermo-regulator for rooms Heated by Steam, J. C. Arthur ; Archæology of Tippecanoe County, O. J. Craig ; Some Indian Camping Sites near Brookville, A. W. Butler ; Relation of Kings County Traps to those of Cumberland County, N. S., V. F. Marsters ; The Traps of Red Head, N. B., V. F. Marsters ; On Birds in Western Texas and Southern New Mexico (by title), A. W. Butler ; An Account of Vegetable and Mineral Substances that Fell in a Snow Storm in LaPorte County, Jan. 8-9, '92 (by title), A. N. Somers ; How a Tendril Coils, D. T. MacDougal ; Remarkable Prehistoric Relic, E. Pleas ; The Brun's Group of Mounds, H. M. Stoops ; Some Points in the Geology of Mount Orizaba (by title), J. T. Scovell ; Two-ocean Pass (by title), B. W. Evermann ; The Blattidæ and Phasmidæ of Indiana, W. S. Blatchley ; Forestry Exhibit of Indiana at the Columbian Exposition, Stanley Coulter ; The Yolk Nucleus, J. W. Hubbard ; Some Causes Acting Physiologically Toward the Destruction of Trees in Cities, J. C. Arthur ; British Columbia Glaciers, C. H. Eigenmann ; A State Biological Survey—a Suggestion for Our Spring Meeting, L. M. Underwood ; The Mounds of Brookville Township, Franklin County, Ind., H. M. Stoops ; How the Colleges could aid the Public Schools in Teaching Biological Subjects, W. W. Norman ; Notes on the Flora of the Chilhowee and Great Smoky Mountains, Stanley Coulter ; The Need of a Large Library of Reference in Cryptogamic Botany in Indiana—What the Colleges are Doing to Supply the Deficiency, L. M. Underwood ; Exhibition of a Series of Grouse and Ptarmigan from Alaska, B. W. Evermann ; Botanical Assemblies in the United States Announced for the Year 1893, J. C. Arthur ; Development of Ovule in *Aster* and *Solidago* (by title), G. W. Martin ; Remarks on Archæological Map Making (by title), A. W. Butler ; The Lilly Herbarium and its Work, John S. Wright ; Additional Facts Regarding Forest Distribution in Indiana, Stanley Coulter ; Rotary Blowers, John T. Wilken ; Some Effects of Mutilation on the Forms of Leaf and Sex of *Morus alba* and *Morus nigra* (by title), A. N. Somers ; The Crawford Mound (by title), H. M. Stoops.